19 October 2001

Potential Collaboration of Boeing ATM with FAA/ATA Spring 2002 Enroute Work Group

Overview

This document is in response to the Boeing ATM / Spring 2002 (S2K) Enroute Working Group meeting held 5 October 2001 in Arlington, VA where candidate areas of collaboration were discussed. More detailed suggestions as to specific work areas have been developed by Boeing ATM and are contained below. This material is for informational use toward more formal collaboration. Detailed schedule and labor estimates through a formal statement of work could be provided in a subsequent document, after greater definition is provided for the activities. All candidate areas of collaboration would require regular, routine, and controlled access to traffic flow management data and to technical and operational experts from government (e.g. FAA, Volpe) and airlines (e.g. dispatchers with ATM liaison responsibilities).

The activities proposed are meant to align and support the objectives and interests of the S2K group.

Candidate Areas

A Analysis of NAS data accuracy and quality
B Traffic Flow Management (TFM) Tool Integration Analysis
C Design of a Future NAS Flow Management System
D Laboratory Development and Testing of Aircraft-AOC-ATM collaborative decision making tools or functionalities

Point of Contact

Rick Zelenka, Boeing ATM, 7901 Jones Branch Drive, MC 7902-3100, McLean, VA 22102
(703) 584-2929, richard.e.zelenka@boeing.com

Candidate Area A: Analysis of NAS data accuracy and quality

Example Activity
Boeing and the S2K committee are both interested in understanding the inherent accuracy and quality limitations of existing data sources necessary to accurately forecast weather, predict actual traffic loads, and predict traffic demand in a dynamic flow management system. This activity would support the S2K objectives of measuring system predictability and improving near-term situational awareness. The S2K committee, in collaboration with Boeing, could explore focused analysis scenarios and analysis tasks. Such activities would employ statistical analysis and/or Boeing fast-time simulation models in areas such as: ETMS and CDM aggregate demand list data accuracy, weather and traffic load prediction uncertainty, and NAS status information such as airport acceptance rates prediction. Upon receipt of a recommended data set for analysis to support enhanced NAS traffic flow management, Boeing could prepare a plan of analysis and statement of work. The proposal of work would include at minimum the following elements:

- Scope
- Technical approach
- Task descriptions
- Analysis deliverables
- Schedule

External Requirements to Support the Activity
This analysis work would require:

- Regular, routine, and controlled access to traffic flow management data and to technical and operational experts from government (e.g. FAA, Volpe) and some airlines (e.g., AOC dispatch personnel).
- Access to operational and developmental prototype FAA traffic flow tools located at the FAA ATCSCC and other FAA field facilities.
- FAA technical and operational support in understanding tool functions and operation.

Product Description
The product of this effort will be delivered in the form of a statement of work followed by an analysis report covering the execution of that work.

Scope
The following limitation would apply to the products of this candidate area:

- Tools, software or procedures developed by Boeing ATM will be the property of Boeing ATM.

Candidate Area B: Traffic Flow Management (TFM) Tool Integration Analysis

Example Activity
Boeing could prepare a report and a plan which provides a recommendation on how existing NAS Flow Management tools could be utilized in the short to mid-term for transition to a future NAS Flow Management System (as described in candidate area C).
The report could include the following elements:

1. A review of the existing operational TFM tools and a study to evaluate their functions.
2. A review and assessment that evaluates capabilities of TFM tools that are in development or in prototype operations.
3. An assessment of existing TFM tools or functions and their role in the transition to a future flow management system.

External Requirements to Support the Activity
This analysis work would require:

- Regular, routine, and controlled access to traffic flow management data and to technical and operational experts from government (e.g. FAA, Volpe) and airlines (e.g., AOC dispatch personnel.
- Controlled access to operational and developmental prototype FAA traffic flow tools located at the ATCSCC and other FAA field facilities and in research labs such as MITRE, Volpe, and NASA.
- FAA technical and operational support in understanding tool functions and operation.
- Operational tool, software, and access to communication links and data sources to be used in the Boeing TFM simulation lab (see candidate area D), should such lab capabilities be required.

Product Description
The product of this effort will be delivered in the form of a report.

Scope
The following limitations would apply to the product of this candidate area:

- The TFM Tool Integration Analysis would provide a broad description of how existing TFM tools might work together to improve traffic flow management and a transition to the future NAS flow management system.
- The TFM Tool Integration Analysis would focus on addressing pre-departure traffic flow management functions. In order to completely address all aspects of pre-departure traffic, the analysis would factor in functions of all TFM tools (e.g. CRCT, CTAS TMA) that have direct or indirect impact on not-yet-departed traffic.
- Tools, software, or procedures developed by Boeing ATM will be the property of Boeing ATM.

Candidate Area C: Design of a Future NAS Flow Management System

Example Activity
Boeing could develop a design document, termed the Systems Requirements and Objectives (SR&O) document, for the future NAS Flow Management System and provide a companion benefits assessment. The SR&O document could include the following elements:

1. A statement of the high level objectives for the future NAS Flow Management System.
2. A description of the future Flow Management System concept of operations. This would include a description of the key features of the new concept (i.e. the Congestion Management System (CMS)) and a timeline based description of how the system would be used by the various NAS operational areas to manage NAS congestion.
3. A description of the NAS Flow Management System Functional and Performance Requirements associated with the future NAS Flow Management operational concept.
4. A description of how the requirements defined above will be allocated to the NAS infrastructure. This effort will be supported by numerous architectural trade studies needed to assess the relative benefit between two or more architectural options.

External Requirements to Support Activity
The development of the NAS Flow Management System SR&O design document would require input from aircraft operators and the FAA. As such :

- Regular, routine, and controlled access to traffic flow management data and to technical and operational experts from government (e.g. FAA, Volpe) and airline (e.g., AOC dispatch personnel) would be required.
- Technical support in assisting Boeing in obtaining the engineering system design data for the current NAS infrastructure. Such data are necessary to support the development of any transition plan.
- Assistance from the FAA ATCSCC and Volpe in reviewing engineering design data and providing Boeing with technical reviews of draft SR&O material.

Product Description
The product of this effort will be a report to include the Future NAS Flow Management system requirements and objectives, and benefits assessment information, as described above.

Scope
The following limitations apply to the product of this candidate area:

- The SR&O document will not be a detailed system design document, but will instead define the system requirements in sufficient detail to support the development of detailed design specifications.
- The SR&O document will be limited to directly addressing pre-departure flow management, i.e. the flow management system will only directly impactflights up to or near the time of their departure. Airborne flight activity will, however, influence this pre-departure flow management.
- The benefits assessment and SR&O documents are Boeing ATM intellectual property

Candidate Area D: Laboratory Development and Testing of Aircraft-AOC-ATM collaborative decision making tools or functionalities.

Example Activity
Boeing could work with the S2K committee and CDM subgroups to jointly define specific work statements required to support the development of new collaborative decision making functionalities, such as the Flight Plan Pre Processor (FPPP), the Route Advisory message, or other S2K or CDM initiatives. Boeing's role will be to develop and operate a traffic flow management simulation lab facility to test newly defined flow management concepts.

External Requirements to Support Activity
- Access to interface requirements and specifications associated with the functionality or tool under test.
- Access to FAA operational and technical support relative to the functionality under test.
- Access to current traffic flow management automation and data sources, e.g. Flight Schedule Monitor (FSM) and Traffic Situation Display (TSD).
- CDMNet or other network connections as required.

Product Description
For each test conducted, Boeing ATM would document the test results in the form of a Test Report. The Test Report would include the following:
- Description of Test
- Description of Test Results
- Conclusions and Recommendations

Scope
The following limitation will apply to the products of this candidate activity:
- Tools, software, or procedures developed by Boeing ATM will be the property of Boeing ATM.